

COLEACP PIP

Sustainable production practices



COMBATting SOIL EROSION

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ACP fruit and vegetable sectors
Brochure for producers and exporters



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FOR SUSTAINABLE DEVELOPMENT OF
THE ACP HORTICULTURAL INDUSTRY

This brochure is made available by the PIP to fruit and vegetable producers and exporters in the ACP (Africa, Caribbean, Pacific) countries. The instructions contained in the following pages are meant to assist producers faced with soil degradation and erosion.

The brochure presents messages and instructions to protect soil from erosion and preserve its production potential.

Brochures on other topics are also available from the PIP (<http://www.coleacp.org/pip>).

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Introduction

Erosion is a natural phenomenon that can have beneficial effects – such as depositing fertile sediment – as well as harmful effects. It is therefore not necessarily desirable to stop all erosion, but it has to be reduced to an acceptable level.

Erosion is a problem that gets worse and worse:

1. Loss of organic matter, clay, silt and nutrients
2. Reduced soil stability
3. Reduced soil fertility
4. Formation of a compact surface crust
5. Less infiltration
6. Faster runoff
7. Soil loss
8. Exposure of bare rock (stripping of topsoil)

What are the signs of erosion?

- Formation of gullies and rills
- Plant root systems laid bare
- Stones rise to the surface of the soil
- Mud-coloured runoff
- Signs of landslide

Three key factors make erosion worse:

1. Deforestation and destruction of plant cover, which lays soil bare
2. Poor crop practices, which weaken soil
3. Prolonged drought followed by torrential rain, which both attack soil

List of messages and instructions to combat soil erosion

Avoid using practices that make erosion worse

1. Do not light brush fires. Maintain plant cover.
2. Do not destroy the forest or clear hedges or windbreaks.
3. Avoid prolonged set-aside that leaves soil bare.

Reduce runoff and channel the water

1. Build border levees to channel water flow.
2. Make crescent-shaped depressions to slow water flow.
3. Build ridges, following the contours of the land.
4. Arrange rows along the contour of slopes to reduce runoff.
5. Install stone barriers to retain water and sediments.

Fight soil erosion effectively

1. Maintain soil structure (keep clods on the surface).
2. Work organic matter into the soil and conserve humus.
3. Mulch between crop rows or associated crops.
4. Plant rows at a right angle to the slope.
5. Install windbreaks and plant hedges.
6. Grow crops in terraces on slopes.
7. Replant trees and hedges.

What are the causes of soil erosion?



Erosion caused by water (hydric)

It is caused by rainwater and runoff, especially when soil is left bare.

Hydric erosion is made worse by poor agricultural practices that weaken soil.



Erosion caused by poor practices

Crop practices, work in the fields, fires and excessive deforestation change the consistency of topsoil: clods disappear, smooth areas form on the soil surface.



Erosion caused by wind

Bare and sandy soil is particularly vulnerable.

Erosion removes the components from soil that make it productive and reduces its water retention, making it even more vulnerable.

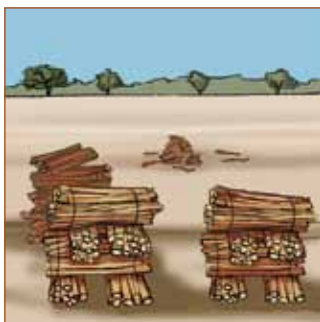
What are the factors that make erosion worse?



Destroying vegetation

- ▶ Avoid brush fires before planting.
- ▶ Keep the soil covered with vegetation.

Prevent plant cover from disappearing, especially trees, because this contributes to erosion, soil leaching and the appearance of laterites.



Cutting trees

- ▶ Avoid uncontrolled cutting of trees.
- ▶ Harvest the forest sensibly.

Replant with harvestable species (trees and shrubs that fix nitrogen, lose their leaves and do not compete with crops, fruit trees, rubber trees, cacao trees, etc.).



Removing shrubs Leaving bare soil

- ▶ Avoid destroying windbreaks.
- ▶ Avoid prolonged set-aside.

Plant protective hedges of trees or shrubs in lines following the contour of the land (or at least across the slope) to slow runoff, collect sediment and gradually result in the formation of terraces.

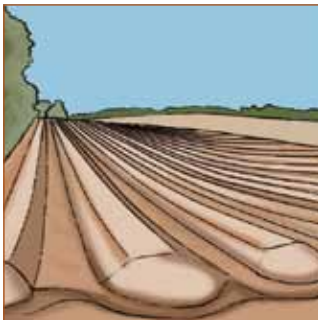
How to fight soil erosion?



Reduce runoff

- ▶ Build border levees to channel water and reduce the pressure of the water that runs off.

This ensures better distribution of water in the field and keeps the soil from being stripped and washed away.



Channel the water runoff

- ▶ Make ridges to channel water (if possible, following contours, even when the ground is only slightly sloped).

This directs the water runoff to keep the soil from being washed away.



Plant in crescent-shaped depressions

- ▶ Dig crescent-shaped depressions if the ground is flat.

This helps hold back water runoff and facilitates its infiltration in the soil.

How to fight soil erosion? (continued)



Maintain a lumpy and porous soil structure

- ▶ Keep soil cloddy and permeable by working in organic matter (compost, manure, crop residues, etc.).

This enables the soil to absorb rainwater better. The organic matter fertilises the soil.



Lay stone barriers

- ▶ Install lines of stones perpendicular to the slope, to build light and permeable structures.

This helps slow and filter water that flows over the soil during rainfalls.



Install windbreaks and plant hedges

- ▶ Plant windbreaks and hedges before planting the crop to ensure effective protection from the start.

This helps deflect air flow, slow wind speed, increase water infiltration and promote biodiversity.

How to fight soil erosion? (continued)



Use mulching between crop rows

- ▶ Cover the soil between rows with crop residues.

This helps preserve the soil and retain water in the field. Mulching keeps the soil cooler during the day and reduces heat loss at night.



Adjust the direction of rows on slopes

- ▶ Arrange crop rows perpendicular to the slope.

This slows runoff on the slope. Rainwater collects in the furrows and infiltrates the soil more easily.



Use terracing on steep slopes

- ▶ Build successive terraces if the slope is steep.

This holds back runoff on the slope, helps channel water and increases its infiltration in the soil.

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2 **WATER-SAVING IRRIGATION**

3 **PROTECT BIODIVERSITY**

4 **SOIL FERTILITY MANAGEMENT**

5 **RECYCLE ORGANIC WASTE**

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